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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
09/991,230	11/14/2001	James R. Priest	25135A	3945

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OWENS CORNING
2790 COLUMBUS ROAD
GRANVILLE, OH 43023

EXAMINER
ARTMAN, THOMAS R

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Application No.	Applicant(s)
09/891,220	PRIEST ET AL

Office Action Summary

Examiner	Art Unit
Thomas R Artman	2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s).
4. ☐ Interview Summary (PTO-413) Paper No(s).
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Other

DETAILED ACTION

Claim Objections

The amendment to claim 1 has successfully overcome the objection to claim 1 that was made in the previous Office action.

The examiner acknowledges per the applicant's response that claims 8 and 9 are in fact correct as written, and therefore withdraws the claim objections made to claims 8 and 9 in the previous Office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Wright (US 5,212,750).

Regarding both claims, wright discloses the structure as follows in his fiber optic connector (Fig.3):

1) a crimp ring (item 73),

2) a base ring (item 62) with a leading edge (item 71), and

3) a reinforcement fiber (item 35) secured over the leading edge and under the crimp ring such that the radii of curvature of the reinforcement fiber and the leading edge are greater than or equal to the critical bending radius of the reinforcement fiber (col.7, line 62, to col.8, line 7), and

4) the crimp ring does not reduce the load bearing strength of the reinforcement fibers.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright and in view of Higdon et al. (Mechanics of Materials).

With respect to claim 2, though Wright does not disclose the derivation of the critical bending radius, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the critical bending radius is a function of the diameter, elastic modulus, and tensile strength of the reinforcement fiber. The criticality lies in the tensile stress on the radially outermost portion of the fiber caused by its bent state. Higdon provides not only this general information, but also provides a detailed derivation that directly relates the radius of curvature to the bending stresses (p.356), and hence, the tensile stress anywhere on the cross-section of a bent rod. By substituting the tensile strength of the material for the tensile stress in the equation, one can easily compute the critical bending radius of curvature for a rod-like element, which is the same thought process required to complete the homework problem on p.357, #7.5.

with ordinary skill in the art can easily use equations [illegible] and [illegible] on p.[illegible] of Higdon [illegible]

the claimed calculation. From eq.7-1, solve for the moment, M, in terms of the tensile stress (sigma), and then substitute that expression for the moment, M, in eq.7-2 in order to express the radius of curvature as a function of the tensile stress. In this form, one can substitute the maximum tensile stress for the general stress variable in the equation and solve for the desired value. Again, this general process is required for solving the homework problem 7.5 on p.357.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate the critical bending radius of the reinforcement fiber from the derived equations of Higdon in order to maintain the structural integrity of the reinforcement fiber as taught by Wright.

With respect to claim 5, as discussed in the rejection of claims 1 and 4, the leading edge of Wright's base ring has a radius of curvature greater than or equal to the critical bending radius of the reinforcement fiber.

Regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the structure as applied above against claims 1 and 4 as well as the thought processes required for a standard engineering homework problem would satisfy the method as outlined, including: calculating a critical bending radius for a given reinforcement fiber, finding a base ring with a leading edge having a radius of curvature greater than or equal to the calculated critical bending radius, securing the reinforcement fiber around the base ring, and

With respect to claim 7, Write does not specifically disclose determining the material properties and dimensions before performing the calculations. Based upon col.8, lines 3-7, Write does teach an experimental approach in order to determine the critical bending radius for a given reinforcement fiber. Also, as argued above against claims 2-3 in light of Higdon, the claimed calculation is well known and expected of sophomore engineering students.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to readily measure the diameter and run basic tensile tests in order to find a reasonable elastic modulus and tensile strength from one data plot. More realistically, one would find such data on the specification sheet that accompanies the fiber shipment or call the manufacturer to obtain the data.

Regarding claims 8-9, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the structure and method as applied above against claims 1-4 and 6-7 would satisfy the method as outlined, including:

1) selecting a base ring with a leading edge having a first radius of curvature (items 62 and 71 of Fig.3 of Wright, as well as col.8, lines 3-7).

2) determining the diameter, elastic modulus and tensile strength of a selected reinforcement fiber (from manufacturer's specs, typically).

3) determining the critical bending radius of the reinforcement fiber by multiplying the diameter of the fiber by the elastic modulus and dividing by two times the tensile strength (taught

4) making sure the base ring satisfies the required critical bend radius requirement (taught by Wright, col.8, lines 3-7), and

5) securing and crimping the reinforcement fibers around the base ring with the crimp ring.

Response to Amendment

The examiner has considered the applicant's arguments and amendment to claim 1; however, the arguments are not persuasive and the amendment is not sufficient to overcome the prior art.

It is the examiner's determination that the 35 USC 102b rejection stands because Wright (US 5,212,750) anticipates claims 1 and 4. First, the amendment to claim 1 added the phrase "wherein said crimp ring is coupled without reducing the load bearing strength of the at least one reinforcement fiber." This limitation merely recites a desired outcome and is not functionally tied to the specifics of the structure as claimed. There isn't any means by which to compare the reduction of load bearing strength caused by the applicant's crimp ring or Wright's retention band based upon the recited structure in the claims, or in the disclosure or drawings of either Wright or the applicant. In both inventions, the whole purpose is to improve the load bearing capacity of the fibers, or, to minimize load bearing reductions caused by the fastening structures. Designing the curved surfaces to reduce the bending stresses in the reinforcement fibers is part of that desire to minimize the overall effects of the fastening structures on the reinforcement fiber's

Furthermore, the applicant argues that Wright's retention band does not hold the fibers when the fibers are in tension. If that is the case, then Wright's retention band does in fact meet the amended limitation recited above, because the retention band does not affect the reinforcement fibers when they are carrying a tensile load at all. Therefore, the retention band is very effective in improving the load bearing properties of the reinforcement fibers by not reducing their load bearing capabilities.

Also, the examiner has not found evidence in the reference that would reinforce the applicant's position. As described in col.7, lines 30-35, Wright's reinforcement fibers are ultimately fixed in position by the retention band. Without it, the device would not work properly. Furthermore, there isn't any evidence in Wright's disclosure that the retention band causes any significant harm to the load bearing capabilities of the reinforcement fibers.

Further regarding claim 4, Wright's leading edge (item 67 of Fig.3) had a radius of curvature that is greater than or equal to the critical bend radius of the reinforcement fibers, as described, at least in part, at the top of column 8.

The remaining claims are rejected under 35 USC 103a as being unpatentable over Wright and in view of Higdon.

The reliance upon Higdon in the *prima facie* case of obviousness made is to demonstrate that such concepts are not new in the art. The textbook shows all the required equations, and the homework problem on the facing page requires the exact same logic in order to solve the

Furthermore, the method steps of determining and testing for maximum values are taught in other chapters of the textbook that are not currently provided, and they exist in dozens of basic engineering mechanics textbooks. They are common topics of sophomore level engineering lectures and associated practicum.

Further still, Wright suggests such experimentation in that the precise radius was determined, at least in part, by experimentation for the specific reinforcement fibers used and his specific structure (see, by way of example, the top paragraph in col.8). No undue experimentation by one skilled in the art is required in order to determine or calculate the desired maximum stresses or minimum bend radii.

The examiner would also like to add an important point in regards to the applicant's arguments regarding the claimed equation and method of arriving at such an equation. The examiner not only has an engineering degree and took such courses at the sophomore level (the Higdon reference was the examiner's college textbook) but also the examiner *taught* these courses to sophomores in engineering during his graduate studies. The claimed method recites the determination of a critical dimension (in this case, the critical bend radius) by substituting the critical stress for the general stress variable in the equations provided by the textbook, and then performing algebraic manipulation in order to solve for the dimension in question. This is a fundamental, second-nature thought process instilled upon every engineering student, whether it be a physical dimension, a maximum or minimum resistor value in an electrical circuit, etc. Such maximization minimization ideas have been well-established in the engineering disciplines

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hanzawa (US 5,231,685) discloses a prior art crimped reinforcement fiber connector.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Thomas R. Artman
Patent Examiner
June 9, 2003

DAVID V. BRUCE
PRIMARY EXAMINER